PHOTOCOPY

DECLARATION OF NICK BROMER

IN SUPPORT OF APPLICATION SER. NO. 09/708,658

As the sole inventor and Appellant in this case 09/708,658, I declare as follows:

At the time I conceived this invention I had no clear idea of the quantitative relationship between the roughness of a surface and its specularity. I had never heard of the abbreviation "RA" and was not familiar with the RMS measurement of surface roughness (although my training allowed me to understand it as soon as I heard of it). I knew that the prior-art ceramic-coated surfaces were not specular; that this lack of specularity indicated a rough surface; and that a rough surface was not the optimum, but would be better if made smoother (as shown in my drawings and explained in my specification).

I guessed that specularity would be a good criterion of whether or not a surface were smooth enough to present a flat ceramic plate as the cutting edge, as illustrated in my drawing Figures 2 and 4. (Guessing is a valid mode of invention. Under § 103, patentability is not negatived by the manner of invention.) When Examiner Druan applied the Williams reference, my guess was put to the test. I went to the PTO library and found numerous old books that showed that the roughness disclosed by Williams is typical of a honed surface, and I knew that honed surfaces (for example, the inside of an auto engine cylinder) is not specular, because not even a faint image is visible in it. I submitted photocopies of these old books from the PTO library with the Amendment After Final Rejection on December 18, 2002.

Then I went to the physics section of the library of my old school, Millersville University, and found some dictionary pages that were also submitted. More importantly, I found the Bennett and Mattsson book, copies of which were also submitted with the December 18

amendment. This book deals directly with the central question: does the range disclosed by Williams include a specular surface?

The lower end of the Williams range, 0.1 RA (which the Examiner appears to agree is substantially the same as 0.1 μm RMS) is equal to 1000 Å. As it turned out, Bennett and Mattsson disclose exactly half of that, 500 Å or 0.05 μm RMS, as the upper limit of smoothness for specularity. Thus, the limitation of "specular" in claim 1 is outside the range disclosed by Williams, by a factor of two.

I believe that the Bennett and Mattsson book is the best source for determining the relationship between specularity and roughness, and I think that I was lucky to find it. I am aware of no other reference bearing directly on the central question, and I am aware of no other reference that is contrary to the graph of Bennett and Mattsson that I am now relying on. I am well qualified to evaluate Bennett and Mattsson because I have a master's in physics, completed the coursework for a PhD in physics, and taught physics at Penn State for several years.

All statements made herein of my own knowledge are true and were made with the knowledge that wilful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

Nick Bromer

Nick Bromer

[Registration No. 33,478]

February 25, 2003

SECOND DECLARATION OF NICK BROMER

IN SUPPORT OF APPLICATION SER. NO. 09/708,658

As stated in the first declaration submitted in this case, I have a master's in physics, completed the coursework for a PhD in physics, and taught physics at Penn State for several years. I also have a bachelor's degree in mathematics. I now declare that according to my best understanding, the extrapolated version of the graph from page 26 of the Bennett and Mattsson book, attached hereto, shows that the lower limit of the range disclosed by the applied Williams reference, namely Ra = 0.1 μm, is beyond the range that is "specular" according to claim 1, which recites "at least some reflected image is visible on the surface."

I believe that my extrapolation of the graph is valid because, for each wavelength, the graph is based on a mathematical relationship between the scattering and the roughness. Based on my knowledge of physics, this relationship is classical (i.e. not quantum mechanical) and should not change due to scaling. Certainly the experts, Bennett and Mattsson, show no deviations from a straight line.

I state my belief and opinion that the upper limit of the graph, marked "10^0," indicates complete scattering of incident light (10^0 equals 1) and therefore indicates no specularity.

I also state that my extrapolated graph shows that the range disclosed by the Williams reference is completely outside the range of roughness defined by "specular."

By the way, I was told by Hard Chrome Specialists in York, PA (who plated the model) that an underlying surface would need to be polished if chromium plating were to be specular.

All statements made herein of my own knowledge are true and were made with the knowledge that wilful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

Nick Bromer

Nick Bromer [Registration No. 33,478]

April 18, 2003